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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,324	11/04/2003	David Grier	71527.00003	6743

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AKERMAN SENTERFITT
801 PENNSYLVANIA AVENUE N.W.
SUITE 600
WASHINGTON, DC 20004

EXAMINER

PRITCHETT, JOSHUA L

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 09/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/701,324

Applicant(s)

GRIER ET AL.

Examiner

Joshua L. Pritchett

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-119 is/are pending in the application.
- 4a) Of the above claim(s) 9,15-33,45-60 and 76-115 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8,10-14,34-44,61-75 and 116-119 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This action is in response to Amendment filed August 25, 2006. All applicant's arguments have been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 10-14, 34-44, 61-75 and 116-119 are rejected under 35 U.S.C. 102(b) as being anticipated by Grier (US 6,055,106).

Regarding claims 1, 10, 14, 34, 61 and 116, Grier discloses a method of forming movable optical traps comprising generating a focused beam of light (12); directing the focused beam of light at a phase patterning optical element (40) having a variable optical surface to form a plurality of beamlets emanating from the phase patterning optical element, each beamlet having a phase profile (col. 4 lines 56-58; col. 5 lines 12-21); converging the beamlet emanating from the phase patterning optical element at a position between the phase patterning optical element and a single transfer lens (L2) with the phase patterning optical element (Fig. 5); directing the beamlets emanating from the phase patterning optical element through the single transfer lens to

overlap the beamlets at the back aperture (24) of a focusing lens (20; Fig. 5); and converging the beamlets emanating from the focusing lens to form a plurality of optical traps (50; Fig. 5). Grier further discloses a plurality of small particles (abstract). The virtual lens is the encoded surface of the phase patterning optical element.

Regarding claims 2, 4, 11, 13 and 117, Grier discloses altering the position of the convergence of at least one beamlet emanating from the phase patterning optical element by varying the optical surface to change the location of at least one optical trap (col. 5 lines 18-21).

Regarding claims 3, 12 and 118, Grier discloses the optical traps are optical tweezers (col. 3 line 20).

Regarding claims 5, 73 and 119, Grier discloses manipulating biological material with the optical traps (col. 1 line 57).

Regarding claims 6-8, 74 and 75, Grier discloses the light beam is a laser beam in the visible spectrum (col. 6 lines 2-3). A laser with a wavelength of 532 is within the green light portion of the visible spectrum.

Regarding claims 35 and 62, Grier discloses the single transfer lens is movable (col. 2 lines 30-33; col. 4 lines 17-28)

Regarding claims 36 and 65, Grier discloses the phase patterning optical element has a static surface (col. 5 lines 12-21).

Regarding claims 37 and 66, Grier discloses the static surface is repositionable to align different portions of the static surface to receive the beam of light (col. 5 lines 12-21).

Regarding claims 38 and 67, Grier discloses the static surface is comprised of two or more discrete non-homogeneous regions (col. 5 lines 12-21).

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Regarding claims 39, 64 and 68, Grier discloses the static surface is substantially constantly varying (col. 5 lines 12-21).

Regarding claims 40 and 69, Grier discloses the phase patterning optical element is a hologram (col. 5 lines 18-21).

Regarding claims 41 and 70, Grier discloses the phase patterning optical element is dynamic (col. 5 lines 12-21).

Regarding claim 42, Grier discloses selectively varying the encoded virtual lens changes the number of beamlets emanating therefrom (col. 4 lines 33-36).

Regarding claim 43, Grier discloses selectively varying the encoded virtual lens changes the position of the convergence of at least one of the beamlets emanating therefrom (col. 4 lines 56-58).

Regarding claim 44, Grier discloses selectively varying the phase patterning optical element changes the phase profile of at least one of the beamlets emanating therefrom (col. 5 lines 18-21).

Regarding claim 63, Grier discloses the optical traps corresponding to the movement of the transfer lens (col. 2 lines 30-33).

Regarding claim 71, Grier discloses the phase patterning optical element is a variable liquid crystal phase shifting array (col. 5 lines 18-21).

Regarding claim 72, Grier discloses a computer selectively varying the phase patterning optical element (col. 5 lines 18-21).

Response to Arguments

Applicant's arguments filed August 25, 2006 have been fully considered but they are not persuasive.

Applicant argues the Grier reference does not teach or suggest a phase patterning diffractive element having a variable surface to form a plurality of beamlets. Applicant provides not reasoning to support this assertion. The Grier reference states the beams are split into a preselected pattern (col. 4 lines 56-58). Applicant also argues the Grier reference lacks a single transfer lens through which beamlets are directed. Lens L2 receives all the light emitted from the diffractive element (40) as seen in Fig. 5.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion


THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joshua L Pritchett 
Examiner
Art Unit 2872


DREW A. DUNN
SUPERVISORY PATENT EXAMINER